

MONTHLY WEATHER REVIEW.

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INTRODUCTION.

The MONTHLY WEATHER REVIEW for March, 1902, is based on reports from about 3,100 stations furnished by employees and voluntary observers, classified as follows: Regular stations of the Weather Bureau, 162; West Indian service stations, 13; special river stations, 132; special rainfall stations, 48; voluntary observers of the Weather Bureau, 2,562; Army post hospital reports, 18; United States Life-Saving Service, 9; Southern Pacific Railway Company, 96; Hawaiian Government Survey, 200; Canadian Meteorological Service, 33; Jamaica Weather Office, 160; Mexican Telegraph Service, 20; Mexican voluntary stations, 7; Mexican Telegraph Company, 3; Costa Rican Service, 7. International simultaneous observations are received from a few stations and used, together with trustworthy newspaper extracts and special reports.

Special acknowledgment is made of the hearty cooperation of Prof. R. F. Stupart, Director of the Meteorological Service of the Dominion of Canada; Mr. Curtis J. Lyons, Meteorologist to the Hawaiian Government Survey, Honolulu; Señor Manuel E. Pastrana, Director of the Central Meteorological and Magnetic Observatory of Mexico; Camilo A. Gonzales, Director-General of Mexican Telegraphs; Mr. Maxwell Hall, Government Meteorologist, Kingston, Jamaica; Capt. S. I. Kimball, Superintendent of the United States Life-Saving Service; Lieut. Commander W. H. H. Southerland, Hydrographer, United States Navy; H. Pittier, Director of the Physico-Geographic Institute, San Jose, Costa Rica; Capt. François S.

Chaves, Director of the Meteorological Observatory, Ponta Delgada, St. Michaels, Azores; W. M. Shaw, Esq., Secretary, Meteorological Office, London; and Rev. Josef Algué, S. J., Director, Philippine Weather Service.

Attention is called to the fact that the clocks and self-registers at regular Weather Bureau stations are all set to seventy-fifth meridian or eastern standard time, which is exactly five hours behind Greenwich time; as far as practicable, only this standard of time is used in the text of the REVIEW, since all Weather Bureau observations are required to be taken and recorded by it. The standards used by the public in the United States and Canada and by the voluntary observers are believed to conform generally to the modern international system of standard meridians, one hour apart, beginning with Greenwich. The Hawaiian standard meridian is $157^{\circ} 30'$, or $10^{\circ} 30'$ west of Greenwich. The Costa Rican standard of time is that of San Jose, $0^{\circ} 36' 13''$ slower than seventy-fifth meridian time, corresponding to $5^{\circ} 36'$ west of Greenwich. Records of miscellaneous phenomena that are reported occasionally in other standards of time by voluntary observers or newspaper correspondents are sometimes corrected to agree with the eastern standard; otherwise, the local standard is mentioned.

Barometric pressures, whether "station pressures" or "sea-level pressures," are now always reduced to standard gravity, so that they express pressure in a standard system of absolute measures.

FORECASTS AND WARNINGS.

By Prof. E. B. GARRIOTT, in charge of Forecast Division.

Several storms of marked intensity moved from the United States coasts northeastward over the Canadian Maritime Provinces, and advanced thence over the Atlantic in high latitudes. During the third decade of the month a succession of areas of low barometric pressure whose centers passed north of Scotland, caused high winds, low temperature, and rain or snow over a great part of the British Isles and along the central and north coasts of western Europe. In the United States energetic storms were numerous. Some of these storms moved rapidly inland from the north Pacific coast, and others first appeared over the Rocky Mountain and Plateau regions, and, as a rule traveled rapidly north of east to the Atlantic coast. The most important storm of the month appeared over Nevada on the morning of the 13th, and moved eastward to Colorado by the morning of the 14th, where, at Denver, the barometer reduced to sea level was 29.10 inches, with one exception the lowest reading reached at that station during March in thirty years. Moving north of east with a gradual loss of strength, this storm reached Lake Superior on the 16th. The severest cold wave and snowstorm of the month followed in its wake, extending over the northern Rocky Mountain region and the middle and northern Rocky Mountain slope during the 14th, advancing over the upper Mississippi Valley and the upper

Lake region during the 15th and 16th, and reaching the lower Lake region on the 17th; the cold wave covered the Atlantic coast districts during the 17th. The snow fall was heavy and the cold intense for the season in the States of the upper Missouri Valley, and thence over the middle Rocky Mountain districts. The highest wind velocities of the month occurred in connection with a severe storm which appeared on the north Pacific coast on the 1st. On that date the wind maintained a velocity of over 100 miles an hour for several hours at Point Reyes Light, Cal. During the closing days of March the temperature continued low in the extreme southwest, and on the 25th a remarkable fall occurred in the mountain districts of Arizona, a minimum of -8° being recorded at Flagstaff. Ample warnings were issued in connection with the cold waves and storms of the month in the central and northern districts, and the occurrence of frost was successfully forecast in the Southern States.

The following report has been rendered by the Weather Bureau observer at Wilmington, N. C., relative to warnings issued in that section in advance of the cold wave of the second decade of the month:

In connection with the severe freeze of this section on the morning of the 19th instant every effort was made to get the warnings of damaging